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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/728,829	LI ET AL.	
	Examiner	Art Unit	
	Joshua Smith	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig et al. (Patent No.: US 7,154,854 B1) in view of Yao et al. (Patent Number: 6,097,697), Agarawal et al. (Patent No.: US 6,434,191 B1), and Cheng (Patent No.: US 6,745,352 B2), hereafter referred to as Zweig, Yao, Agarawal, and Cheng, respectively.

As for Claim 1, Zweig teaches in column 8, lines 37-41 and 53-57, of a pre-determined upper threshold related to a maximum tolerated transmission error factor, and of a pre-determined lower threshold related to a minimum transmission error factor (substantively the same as "includes a predetermined threshold pair of a high PER (packet error rate) threshold, denoted as Q_H(R), and a low PER threshold, denoted as Q_L(R)" and "Q_H(r_n) and the Q_L(r_n)" in the instant invention).

Zweig also teaches in column 8, lines 24-27, and in FIG. 4, Sheet 3 of 4, "In step 402, the AP first transmits one or more data packets", and FIG. 4 shows that the method of Zweig is a loop, implicitly teaching that a group of packets is transmitted for each revolution of the method (substantively the same as "transmitting a first plurality of packets" and "transmitting a second plurality of packets" in the instant invention).

Zweig also teaches in column 8, lines 41-44, and in FIG. 4, Sheet 3 of 4, "In step 404, the AP determines a factor indicative of the error(s) that occurred in the transmission of the one or more data packets ... the AP can determine the transmission error factor by the amount of acknowledgment packet(s) received in response to its transmissions of the one or more data packet(s)", and FIG. 4 shows that the method of Zweig is a loop, implicitly teaching that a group of acknowledgment packets is received for each revolution of the method for the packets transmitted in step 402 (substantively the same as "receiving a first plurality of acknowledge packets, each one in the first plurality of acknowledge packets responding to one of the first plurality of packets" and "receiving a second plurality of acknowledge packets, each one in the second plurality of acknowledge packets responding to one in the second plurality of packets" in the instant invention).

Zweig also teaches in column 8, lines 41-44, and in FIG. 4, Sheet 3 of 4, "If the transmission error factor increases above the upper threshold as determined in step 406, this indicates that significant data transmission errors are occurring in the wireless medium requiring a decrease" in a parameter, and FIG. 4 shows that the method of Zweig is a loop, implicitly teaching that this process is conducted for each revolution of

the method (substantively the same as "reducing ... if the P_1(r_n) being larger than the Q_H(F_n)" and " reducing ... if the P_2(r_n), being larger than the Q_H(r_n)" in the instant invention).

Zweig also teaches in column 8, lines 57-59, and in FIG. 4, Sheet 3 of 4, "If the transmission error factor falls below the lower threshold as determined in step 410, this indicates that" a transmission parameter "can be increased" (substantively the same as "increasing ... if the P_2(r_n) being smaller than the Q_L(r_n)" in the instant invention).

Zweig also teaches in column 8, line 64 to column 9, line 4, and in FIG. 4, Sheet 3 of 4, "If the transmission error factor is above the lower threshold as determined in step 410, this indicates that there are some data transmission errors, not significant as to require a decrease in the" transmission parameter, "but significant enough not to increase it either. Thus, the current" transmission parameter "is maintained, and the AP subsequently transmits one or more data packet(s) to the associated WU(s) using the current" transmission parameter (substantively the same as "keeping ... if the P_2(r_n) falls between the Q_H(r_n) and the Q_L(r_n)" in the instant invention). Zweig does not teach of the adapting transmission parameter being the transmission rate, determining a first and second number according to a PER upper and lower thresholds, estimating a first and a second PER from transmitted and acknowledged packets, and numbers where the first and second PERs are substantially reliable.

However, in the same field of endeavor, Yao teaches in column 4, lines 20-22, of a component that adapts the transmission rate based on multiple indicators, including packet loss (substantively the same as "the transmission rate" in the instant invention).

Yao also teaches in column 2, lines 31-33, a method involving transmitting data and accepting acknowledgments of receipt of the transmitted data, and, in column 4, lines 23-33, and FIG. 2, Sheet 2 of 7, a sequence of dP = 17 packets, and where dL = 6 packets are lost or damaged, and where the loss rate, L, is the fraction of packets that are lost in the sequence, or L = 6/17 = 0.35, which also implicitly teaches that the number of not lost is less than the number of packets transmitted (substantively the same as "the number of the first plurality of acknowledge packets is A1, A1 is a positive integer and AI=N1, wherein a first estimated PER, denoted as P_1(r_n), corresponding to the current transmission rate is P_1(r_n)=(N1-A1)/N1" and "the number of the second plurality of acknowledge packets is A2 and A2=(N2-N1), wherein a second estimated PER, P_2(r_n), corresponding to the current transmission is P_2(r_n)=(N2-A1-A2)/N2" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Yao with the invention of Zweig since Yao provides a method for controlling the transmission rate based on packet loss, and could be controlled by the error factor thresholds of Zweig, which will enhance the usage of the thresholds by employing them in controlling the transmission rate.

In the same field of endeavor, Agrawal teaches in column 6, lines 30-32, of a component that uses the BER to adaptively determine the number of packets to send in a packet sequence over a path, and, in column 5, lines 11-13, and FIG. 3A, Sheet 4 of 11, sequence 210 and sequence 310 are composed of different numbers of packets, where sequence 310 is composed of one less packet than sequence 210 (substantively the same as "determining a first number N1 and a second number N2 according to the

Q_H(F_n) and the Q_L(r_n), respectively, wherein N1 and N2 are positive integers, r_n denotes the current transmission rate, the subscript n denotes a adaptation iteration index" and "the number of the first plurality of packets is N1" and "the number of the second plurality of packets is (N2-N1)" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Agrawal with the invention of Zweig since Agrawal provides a method where the number of packets to send can be determined and controlled by the error factor thresholds of Zweig, which will enhance the usage of the thresholds by employing them in controlling the number of packets that are sent at a time.

In the same field of endeavor, Cheng teaches in column 7, lines 33-36, error estimates can be made more reliable by observing a large predetermined number of data frames (substantively the same as "the numbers N1 and N2 are large enough such that the P_1(r_n) and the P_2(r_n) are substantially reliable" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Cheng with the invention of Zweig since Cheng provides an alternative method of accurately and efficiently determining the error rate and can be incorporated into the method of Zweig to determine error factors and thresholds.

Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Yao, Agarawal, Cheng, and in further view of Varma et al. (Patent No.: US 6,643,322 B1), hereafter referred to as Varma.

As for Claim 2, the references as applied to Claim 1 teach the limitations except checking if M consecutive packets of the first or second plurality of packets failed to be acknowledged and where M is an integer. However, in the same field of endeavor, Varma teaches in column 6, lines 18-22, and FIG. 5, Sheet 3 of 4, monitoring a number of successive no-acknowledgement messages (substantively the same as "checking if M consecutive packets of the first or second plurality of packets being failed to be acknowledged, ... , wherein M is an integer" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Varma with the invention of Zweig since Varma provides an alternative method of measuring errors by monitoring the number of successive no-acknowledgement messages and comparing it to a threshold and can be incorporated into the error-measuring and error-threshold aspects of Zweig.

Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Yao, Agarawal, Cheng, and in further view of Tanigichi et al. (Patent No.: US 6,445,679 B1), hereafter referred to as Tanigichi.

As for Claim 3, the references as applied to Claim 1 teach the limitations except where the transmission rate is unchanged at the lowest one or the highest one. However, in the same field of endeavor, Tanigichi teaches in column 4, lines 42-52, a transmission rate control range setting means for setting a minimum transmission rate if the transmission rate is sufficiently low and a maximum transmission rate if the transmission rate is sufficiently high (substantively the same as "the transmission rate

remains unchanged if the transmission rate at the step of reducing the transmission rate is the lowest one, or the transmission rate at the step of increasing transmission rate is the highest one" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Tanigichi with the invention of Zweig since Tanigichi provides a method where transmission rates are controlles within a range to enhance quality of service, and the error factor thresholds of Zweig can be included in the quality of service settings, enhancing the usage of the thresholds by employing them in controlling the transmission rate.

Claims 4 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi.

As for Claim 4, Zwieg teaches in column 8, lines 27-28, and FIG. 4, Sheet 3 of 4, in step item 404, determining a factor indicative of the error(s) that occurred in a transmission (substantively the same as "(1) calculating a first estimated PER, denoted as P_1(r_n)" in the instant invention).

Zweig also teaches in column 8, lines 37-38, and FIG. 4, Sheet 3 of 4, comparing a transmission error factor to a predetermined upper threshold, where, in step item 406 shows "IS FACTOR ABOVE AN UPPER THRESHOLD?", and if "YES" is correct, the routine enters step item 408, and if "NO" is correct, the process enters step item 410 (substantively the same as "(2) checking whether the P_1(r_n) being larger than the Q_H(r_n), if yes, processing step (3), else processing step (4)" and "(7) checking

whether the P_2(r_n) being larger than the Q_H(r_n), if yes, processing step (8)" in the instant invention).

Zweig also teaches in column 8, lines 45-46, and FIG. 4, Sheet 3 of 4, the routine will reduce a transmission parameter at step item 408 (substantively the same as "reducing" in the instant invention).

Zweign also teaches in column 8, lines 27-28 and 33-36, and FIG. 4, Sheet 3 of 4, routine item 400 is a looping routine, showing an error factor is calculated for every revolution of the routine will, and multiple revolutions of the routine will produce multiple error factors (substantively the same as "(4) calculating a second estimated PER, denoted as P_2(r_n)" in the instant invention).

Zwieg also teaches in column 8, lines 53-54, and FIG. 4, Sheet 3 of 4, comparing a transmission factor error to a pre-determined lower threshold, where step item 410 consists "IS FACTOR BELOW A LOWER THRESHOLD?", and if "YES" is correct, the routine enters step item 412, and if "NO" is correct, the routine enters step item 402 (substantively the same as "(5) checking whether the P_2(r_n) being smaller than the Q_L(r_n), if yes, processing step (6), else processing step (7)" in the instant invention).

Zweig also teaches in column 8, line 61, and FIG. 4, Sheet 3 of 4, the routine will increase a transmission parameter (substantively the same as "increasing" in the instant invention). Zwieg does not teach of changing a transmission rate and ending a method.

However, in the same field of endeavor, Tanigichi teaches in column 2, line 1, "dynamic adjustment of a transmission rate" (substantively the same as "transmission rate" in the instant invention).

Tanigichi also teaches in column 29, lines 25-29, and FIG. 26, Sheet 22 of 27, a flow chart involving a setting change of a transmission rate, where the flow chart ends at decision step item 119 and if "YES" is correct, ending the flow chart at "STREAM TRANSMISSION END" (substantively the same as "ending the method" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Tanigichi with the invention of Zweig since Tanigichi provides a method for controlling the transmission rate based on quality of service, and could include the error factor thresholds of Zweig, enhancing the usage of the thresholds by employing them in controlling the transmission rate.

As for Claim 11, the references as applied to Claim 4 teach the limitations except where the transmission rate is unchanged at the lowest one or the highest one. Tanigichi further teaches in column 4, lines 42-52, a transmission rate control range setting means for setting a minimum transmission rate if the transmission rate is sufficiently low and a maximum transmission rate if the transmission rate is sufficiently high (substantively the same as "the transmission rate remains unchanged if the transmission rate at the step of reducing the transmission rate is the lowest one, or the transmission rate at the step of increasing transmission rate is the highest one" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Tanigichi with the invention of Zweig since Tanigichi provides a method where transmission rates are controlles within a range to enhance quality of service, and the error factor thresholds of Zweig can be included in

the quality of service settings, enhancing the usage of the thresholds by employing them in controlling the transmission rate.

Claims 5, 7, and 9, rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, and in further view of Cheng.

As for Claim 5, the references as applied to Claim 4 teach the limitations except determining a first number according to an error rate upper threshold, transmitting a first number of packets, receiving acknowledgements for each packet, and calculating a first estimated packet error rate accordingly. Zweig further teaches in column 10, lines 23-31, and FIG. 5, Sheet 4 of 4, of how the fragmentation threshold transmission parameter, which can be determined by the error factor upper threshold as discussed above with respect to Claim 4, will determine the number of packets that will be used to send 1500 bytes of data, and each packet will have a corresponding acknowledgement packet (substantively the same as "determining a first number according to the Q_H(F_n) ... transmitting a first plurality of packets, wherein the number of the first plurality of packets equals to the first number ... receiving a first plurality of acknowledge packets, wherein each one in the first plurality of acknowledge packets responding to one of the first plurality of packets" in the instant invention).

Zweig further teaches in column 8, lines 33-36, the transmission error factor is determined by the amount of acknowledgement packet(s) received in response to the transmission of the one or more data packet(s) (substantively the same as "calculating

the first estimated PER P_1(r_n) according to the number of the first acknowledge packets and the number of the first plurality of packets" in the instant invention).

In the same field of endeavor, Cheng teaches in column 7, lines 33-36, error estimates can be made more reliable by observing a large predetermined number of data frames (substantively the same as "wherein the first number is large enough such that the P_1(r_n) is substantially reliable" in the instant invention). The motivation to combine the invention of Cheng with the invention of Zweig is discussed above with respect to Claim 1.

As for Claims 7 and 9, the references as applied to Claims 4 teach the limitations except determining a second number according to an error rate upper threshold, and a "second". Zweig further teaches in column 10, lines 23-31, and FIG. 5, Sheet 4 of 4, of how the fragmentation threshold transmission parameter, which can be determined by the error factor lower threshold as discussed above with respect to Claim 4, will determine the number of packets that will be used to send 1500 bytes of data, and each packet will have a corresponding acknowledgement packet, and Zweig also teaches in column 8, line 21, and in FIG. 4, Sheet 3 of 4, that the method of Zweig is a loop, implicitly teaching that multiple groups of packets are transmitted and acknowledged in each revolution (substantively the same as "determining a second number according to the Q_L(r_n)" and "a second" and "the second" and "P_2(r_n)" in the instant invention).

Claims 6, 8, and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi and Cheng, and in further view of Varma.

As for Claims 6, 8, and 10, the references as applied to Claim 4 teach the limitations except checking if M consecutive packets of the first or second plurality of packets failed to be acknowledged and where M is an integer. However, in the same field of endeavor, Varma teaches in column 6, lines 18-22, and FIG. 5, Sheet 3 of 4, monitoring a number of successive no-acknowledgement messages (substantively the same as "checking if M consecutive packets of the first or second plurality of packets being failed to be acknowledged, ... , wherein M is an integer" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Varma with the invention of Zweig since Varma provides an alternative method of measuring errors by monitoring the number of successive no-acknowledgement messages and comparing it to a threshold and can be incorporated into the error-measuring and error-threshold aspects of Zweig.

Claims 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, and in further view of Kilkki et al. (Patent Number: 6,011,778), Huang et al. (Patent No.: US 7,145,876 B2), Amirijoo et al. (Patent No.: US 6,728,217 B1), and Sano et al. (Patent No.: US 6,246,735 B1), hereafter referred to as Kilkki, Huang, Amirijoo, and Sano, respectively.

As for Claim 12, the references as applied to Claim 4 teach the limitations except an adapting direction parameter, estimated throughput associated with

transmission rate, determining estimated throughput being smaller than the previous estimated and if adapting direction parameter is of a first or second direction, performing range adaptation for low and high PER thresholds, and changing transmission rate.

However, in the same field of endeavor, Kilkki teaches in column 3, lines 48-52, a rate variation indicator that indicates whether the cell transmission rate is increasing or decreasing at a particular time, and is used to derive a value that is loaded into cells for transmission (substantively the same as "recording an adapting direction parameter D_n, being one of a first direction, a second direction, and a third value, and the adapting direction parameter representing that the transmission rate is adapted to a higher one, a lower one, and the same one respectively" and "a previous adapting direction parameter D_n-1 is of the first direction" and "the previous adapting direction parameter D_n-1 is of the second direction" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Kilkki with the invention of Zweig since Kilkki provides a method where transmitters can inform receivers of transmission rate changes, giving the receivers in Zweig the potential to adapt to network changes more quickly.

In the same field of endeavor, Huang teaches in column 3, lines 48-55, of a data throughput that is calculated from a channel's raw bit rate, which is related to the bit rate of the channel (substantively the same as "computing an estimated throughput ?(rn) associated with the transmission rate r_n" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Huang with the invention of Zweig since Huang provides a method where throughput

can be calculated from the error rate, allowing the network components of Zweig to calculate the effectiveness in changes made to transmission parameters.

In the same field of endeavor, Walton teaches in column 12, lines 47-51, a throughput of a new value may be compared against the throughput of a previous value, which includes determining if the throughput of the new value is less than the throughput of the previous value (substantively the same as "determining whether the current estimated throughput ?(r_n) being smaller than the previous estimated throughput ?(r_n-1)" in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Walton with the invention of Zweig since Walton provides a method where throughput changes are determined from monitored throughput, allowing Zweig to determine relative improvements from enacting transmission parameter changes.

In the same field of endeavor, Amirijoo teaches in column 6, lines 13-18, a BER-related lower quality threshold that is incrementally increased and where a data rate is changed to a higher data rate (substantively the same as "performing a first range adaptation for adapting the low PER threshold a_L(r_n) associated with the current transmission rate r_n … and increasing the transmission rate" in the instant invention).

Amirijoo also teaches in column 6, lines 59-62, of setting the lower quality threshold stroed in memeory to a lowest value, also stored in memory, and where the data rate is reduced (substantively the same as "performing a second range adaptation for adapting the … the low PER threshold Q_L(r_n-1) associated with the previous transmission rate r_n-1, and decreasing the transmission rate" in the instant invention).

It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Amirijoo with the invention of Zweig since Amirijoo provides a method where BER-related lower thresholds can be changed to suit network conditions, adding flexibility to the threshold techniques of Zweig.

In the same field of endeavor, Sano teaches in column 5, lines 2-4, of a threshold that is varied to suit conditions (substantively the same as “adapting the high ... threshold” in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Sano with the invention of Zweig since Sano provides a method where upper thresholds can be changed to suit network conditions, adding flexibility to the threshold techniques of Zweig.

As for Claim 13, the references as applied to Claim 12 teach the limitations except increasing by a first and second predetermined values. Amirijoo further teaches in column 6, lines 15-24, the lower quality threshold is incrementally increased (substantively the same as “increasing the Q_L(r_n) ... by a first predetermined value” in the instant invention). The motivation to combine the invention of Amirijoo with the invention of Zweig is discussed above with respect to Claim 12.

Sano further teaches in column 5, lines 22-24, the threshold is shifted on the basis of a predetermined conversion equation (substantively the same as “increasing ... by ... a second predetermined value” in the instant invention). The motivation to combine the invention of Sano with the invention of Zweig is discussed above with respect to Claim 12.

As for Claim 14, the references as applied to Claims 12 and 13 teach the limitations except decreasing by a fourth predetermined values. Sano further teaches in column 5, lines 3-4, the threshold is reduced (substantively the same as "decreasing ... by ... a fourth predetermined value" in the instant invention).

Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, and in further view of Barazeche et al. (Patent Number: 4,577,309), hereafter referred to as Barazeche.

As for Claim 15, the references as applied to Claims 4 and 12 teach the limitations except computing a final estimated value, where the final value equals to the second value if the second value is valid, otherwise, the final value equals the first value. However, in the same field of endeavor, Barazeche teaches in column 11, lines 2-9, an excess value is recorded and the excess value equals to a new excess if the new excess value is greater than a past excess value, otherwise, the excess value recorded equals to a past excess value. It would have been obvious to one skilled in the art at the time of the invention to combine the invention of Barazeche with the invention of Zweig since Barazeche provides a method to determine the single greatest amount that a value within a sequence of values exceeds a threshold, allowing the method of Zweig to determine the greatest amount a transmission parameter exceeds its threshold.

Claim 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, Barazeche, and in further view of Ghahramani (Saeed Ghahramani, Fundamentals of Probability – 2^{nd} ed., 2000, Prentice-Hall, Inc., Upper Saddle River, NJ), hereafter referred to as Ghahramani.

As for Claim 16, the references as applied to Claims 4 and 12 teach the limitations except the equation ?(r_n)=?_0(r_n)*(1-P(r_n)). However, in the same field of endeavor, Ghahramani teaches in the upper half of page 109, equation P(AB^c) = P(A)[1 – P(B)]. It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Ghahramani with the invention of Zweig since Ghahramani teaches a formula applicable to determining probability of errors and related error rates, and can aid in determining the error factors and thresholds of Zweig.

Claims 17 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, and in further view of Bringby et al. (Patent No.: US 6,285,883 B1), hereafter referred to as Bringby.

As for Claim 17, the references as applied to Claim 12 teach the limitations except calculating a ping-pong parameter where the pin-pong parameter is increased when a value at different times represents an opposite direction to each other, otherwise, the ping-pong parameter is reset, and determining whether the ping-pong parameter is larger than a ping-pong threshold. However, in the same field of endeavor, Bringby teaches in column 5, lines 6-13 and 42-63, of a function f(osc._rate) that is a function of the rate of oscillating handoff osc._rate, which represents handoff to

different cells (substantively the same as “calculating a ping-pong parameter based on the adapting direction parameters D_n and D_n-1” in the instant invention).

Bringby also teaches in column 5, lines 6-13 and 42-63, the function f(osc._rate) increases though higher normalized weighting as the mobile phone is handed off at a higher rate between two base stations (substantively the same as “the ping-pong parameter is increased when D_n and D_n-1 represents the opposite direction to each other” in the instant invention).

Bringby also teaches in column 5, lines 29-33, if the handoff oscillation rate is above an acceptable level, measures are taken to decline the oscillation rate to an acceptable level (substantively the same as “determining whether the ping-pong parameter being larger than a ping-pong threshold, if yes, processing” in the instant invention). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Bringby with the invention of Zweig since Bringby provides a method where a distance between margins of a hysteresis is varied to optimize performance using an optimal distance between margins, and this method can be incorporated for optimizing the distance between the thresholds of Zweig.

As for Claim 18, the references as applied to Claims 4 and 17 teach the limitations except a step for avoiding ping-pong event is performed before the step of changing the transmission rate. Bringby also teaches in column 2, lines 52-56, a method of setting appropriate hysteresis levels for cells in order to reduce the rate of oscillating handoff, implicitly teaching that the method of Bringby is intended to be

completed prior to a transmission of cells and prior to subsequent handoffs and their associated changes in mobile station and base station communication links (substantively the same as "the step for avoiding ping-pong event is performed before" in the instant invention). The motivation to combine the invention of Bringby with the invention of Zweig is discussed above with respect to Claim 17.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cavin (Patent No.: US 7,143,320 B2) teaches a method of changing bit rate to increase throughput in the presence of intermittent interference involving a packet error ratio. McGhee (Patent No.: US 6,389,065 B1) teaches a method of adapting a baud rate based on a desired bit error rate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Smith whose telephone number is 571-270-1826. The examiner can normally be reached on Monday through Friday, 7:30 AM to 5:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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